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20 November 1957

MEMORANDUM FOR: THE RECORD

SUBJECT : Project Visit to RCA

1. TIME AND PLACE OF MEETING: The meeting was held Friday, 15 November 1957, at [redacted]

2. ATTENDANCE: [redacted]

3. DISCUSSION:

a. [redacted] had prepared a demonstration of the type EA microphone used with a one and two stage transistor preamplifier. The two stage amplifier package included a step-up transformer. The EA microphone is a cut-down version of the type B unit (about 8 db down). It is constructed with a mylar diaphragm and its voice coil is wound for 50 ohms. The unit is designed to accept a probe housing that screws onto the front portion of the microphone case. Also, the one or 2 stage preamplifier package can be operated with the microphone integrally or physically separated and wires run from the microphone to the amplifier. Listening tests were conducted under the following conditions:

- (1) The type EA microphone into the one stage preamp.
- (2) The type EA microphone into the 2 stage preamp with its transformer input.
- (3) The type EA mike into a commercial vacuum tube amplifier.
- (4) With and without the probe attachment.

Although the tests conducted were only of a preliminary nature, the undersigned was well pleased with the results. The 2 stage preamp package was very quiet and [redacted] claims the overall package is only about

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2 db worse (s/n) than using the mike with a vacuum tube arrangement. The EA mike without preamp can be used with or without a probe (the probe housing being not integral with the mike) and represents in a minimum package size a high quality mike whose only drawback is the fewer microvolts of output available for a given sound input.

A prototype EA mike without preamp was given to the undersigned for further testing (the preamplifier portion together with the necessary AP units are to be forwarded in about ten days). [REDACTED] plans to deliver one each of all the hardware discussed to date and pending the outcome of APD tests, a decision will be made as to what further hardware RCA will produce (and in what form) under this task.

b. [REDACTED] reported the following as regards the wireless hearing phone project:

(1) The essential problem to be solved is the development of a sound transducer small enough to fit into the space of the ear canal yet sensitive enough to respond to the audio power available from the rf portion of the circuit.

(2) Efforts at the development of a magnetic sound transducer meeting the necessary requirements were not successful.

(3) Although the use of crystal transducer was a definite possibility, [REDACTED] felt that the job would be a rather formidable one and would be required to develop a successful transducer.

[REDACTED] was directed to prepare a final report on this project detailing the success and failures of the current task. In addition, this report will contain recommendations as to what [REDACTED] felt could be done in solving the problem if additional effort were put into the program.

c. [REDACTED] demonstrated the various directional microphones developed during the course of the program. The conditions were similar to those previously described in earlier reports. The two microphones of most interest were the 24" condenser and the 12" circular line array. (Both of these mikes have also been described in detail in previous reports.) Although the directional efficiency of the 24" condenser was only about 2 db better at 1000 cycles than the line array, the undersigned felt that from the listening tests conducted the condenser unit was quite a bit better. Of course, if the line array was of the same effective area as the condenser, it would have

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been better since it combines the directional properties of a line array with those of circular ring piston microphone. However, an array of this type would be difficult to package for easy transportation and would involve very careful construction in order to obtain the desired properties.

[] will begin soon to prepare the final report on this project which will be a detailed summary of the results obtained together with recommendations for any hardware that should be constructed to meet our requirements.

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d. [] presented a tape recording of the results obtained with the noise reducing device. This recording was made with the device utilizing only 700-3200 cps bandwidth and not using any separate AVC circuit for each channel grouping. The test results listened to by the undersigned did not indicate that any improvement in intelligibility was present by using the equipment. However, the test signal (consisting of speech and noise in approximately 1:1 ratio) was rather a severe case and the results may not be indicative of what can be done if a better signal/noise was used. As discussed in previous reports deciding on a proper testing method is a serious problem. The undersigned believes that the only way in which this device will finally prove its merit or failure is to utilize recordings made under operating conditions which have proved to be difficult to transcribe and determine if the noise reducer eases the transcription difficulty or increased the amount of information that can be extracted. Some means, therefore, should be tried to obtain such test recordings from field personnel (in English) which can be used for such a test.

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